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ROTC SERVICE COMMITMENTS: A COMMENT ON  
THOMAS AND BIERMAN'S PAPER IN PUBLIC CHOICE (Fall 1975)

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Professional Paper No. 167

11

November 1976

12 8p.

14 CINA-Professional Paper-167

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## ROTC SERVICE COMMITMENTS: A COMMENT

In a recent note in this Journal, Thomas and Bierman argue that the military should consider reducing the minimum service requirement for ROTC candidates. Although we agree that the services should consider the trade-off between accessions and minimum obligated service, we find no theoretical basis for the authors' contention that "supply" will be increased and that there will be a higher quality of candidates in the program.

To start, we draw figure 1 with schedules similar to those drawn by Thomas and Bierman.  $q_H$  and  $q_L$  are the "supply schedules" for high quality and low quality candidates, respectively. We have added the schedules vertically,  $q_T$ , to obtain the maximum potential accessions per year. The higher is the minimum service requirement (MSR), the lower is the potential number of accessions. For an MSR of  $M_1$  and demand of  $M_1C$ ,  $M_1A$ , high quality and AC (which is less than  $M_1B$ ) low quality candidates are accessed.

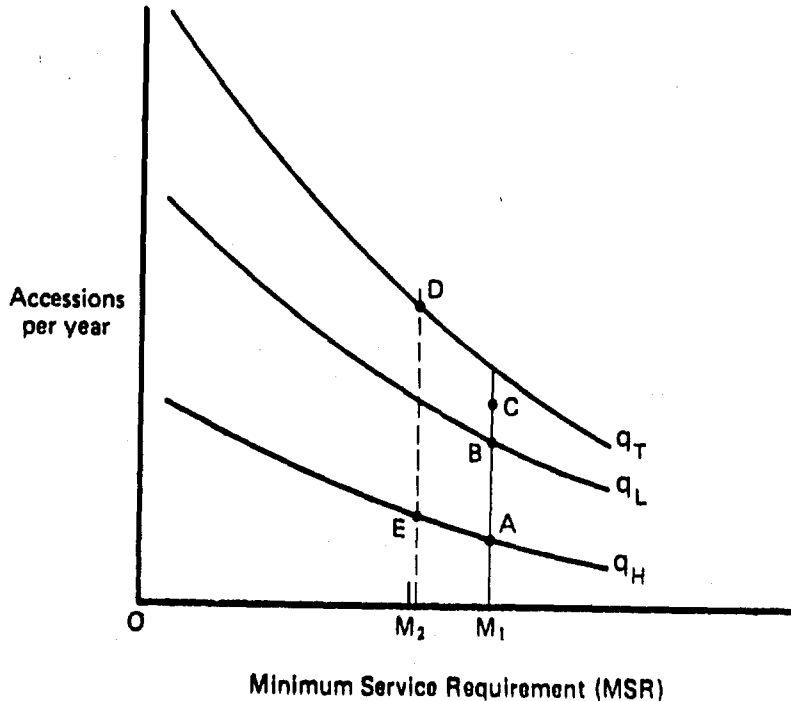


FIGURE 1

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Unfortunately, the curves do not directly depict the demand for and supply of newly commissioned officers. The military's demand is properly stated in terms of man-years acquired: that is, the number accessed times their years of service. The demand is for  $(OM_1 \times M_1 C)$  man-years (assuming no attrition in the first  $M_1$  years and no officers serve beyond MSR). High quality individuals supply  $(OM_1 \times M_1 A)$  man-years; low quality individuals supply  $(OM_1 \times AC)$  man-years. Recognizing that demand and supply is in terms of man-years and not accessions is necessary when calculating the optimal MSR.

If MSR is reduced to  $M_2$ , the services must increase the number of accessions in order to maintain the same number of man-years.<sup>1</sup> If  $(OM_2 \times M_2 D)$  is greater than  $(OM_1 \times M_1 C)$ , then the military can acquire the same number of man-years. The military's "demand curve" in figure 1 (not drawn in) would have unit elasticity. However, if the "supply" of accessions is inelastic with respect to MSR, the military may be unable to acquire the desired number. That is, the increase in the number willing to join the program would not be sufficient to offset the man-years lost because of the lower MSR.<sup>2</sup> Thus, the elasticity of these curves plays a crucial role in determining the optimal MSR.

More importantly, the argument that the services will acquire higher quality individuals is called into question. If  $q_H$  is inelastic in the region of  $M_1$  and  $M_2$ , then fewer high quality man-years are obtained. The high quality man-years is  $(OM_2 \times M_2 E)$ , and this would be lower than  $OM_1 \times M_1 A$ . Since total man-years acquired is constant, the average quality of man-years is reduced.

Even if the high quality curve was sufficiently elastic and the military was still receiving a suitable return on its investment at  $M_2$ , the services may find it optimal

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<sup>1</sup> Thomas and Bierman are clearly aware of this. But they take it for granted that both the quantity and quality of candidates desired will be available.

<sup>2</sup> This assumes that there is some quality, those along  $q_L$  in the example, below which all applicants would be rejected.

to remain at  $M_1$ . If productivity increases with length of service, more man-years would be needed with  $M_2$  than with  $M_1$  to maintain the same level of military readiness (the output). The military's "demand curve" would now have an elasticity greater than one. Since the military operates within a manpower constraint, acquiring the additional manpower may not be feasible.

↳ ~~The writer concludes that~~

In conclusion, the Thomas and Bierman article is remiss in failing to discuss the elasticities of their accession curves. Since the military's demand is for man-years and not accessions, the magnitude of these elasticities is basic to determining the optimal minimum service requirement. Furthermore, there is no reason to expect that the average quality of the man-years acquired will be higher.

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#### REFERENCE

Thomas, L. Joseph and Harold Bierman, Jr., "ROTC Service Commitments," Public Choice, 23 (Fall, 1975), 109-114.

# CNA Professional Papers - 1973 to Present\*

- PP 103  
Friedheim, Robert L., "Political Aspects of Ocean Ecology" 48 pp., Feb 1973. (To be published as a chapter of "Who Protects the Oceans?" published by the American Society of International Law) AD 757 936
- PP 104  
Schick, Jack M., "A Review of James Cable, Gunboat Diplomacy: Political Applications of Limited Naval Forces," 5 pp., Feb 1973. (Reviewed in the American Political Science Review, Vol. LXVI, Dec 1972)
- PP 105  
Curn, Robert J. and Phillips, Gary R., "On Optimal Correction of Gunfire Errors," 22 pp., Mar 1973. AD 761 674
- PP 106  
Stoloff, Peter H., "User's Guide for Generalized Factor Analysis Program (FACTAN)," 35 pp., Feb 1973. (Includes an addendum published Aug 1974) AD 758 824
- PP 107  
Stoloff, Peter H., "Relating Factor Analytically Derived Measures to Exogenous Variables," 17 pp., Mar 1973. AD 758 820
- PP 108  
McConnell, James M. and Kelly, Anne M., "Superpower Naval Diplomacy in the Indo-Pakistani Crisis," 14 pp., 5 Feb 1973. (Published, with revisions, in Survival, Nov/Dec 1973) AD 761 675
- PP 109  
Berghoefer, Fred G., "Salaries-A Framework for the Study of Trend," 8 pp., Dec 1973. (Published in Review of Income and Wealth, Series 18, No. 4, Dec 1972)
- PP 110  
Augusta, Joseph, "A Critique of Cost Analysis," 9 pp., Jul 1973. AD 766 376
- PP 111  
Herrick, Robert W., "The USSR's 'Blue Belt of Defense' Concept: A Unified Military Plan for Defense Against Seaborne Nuclear Attack by Strike Carrier and Polaris/Poseidon SSBNs," 18 pp., May 1973. AD 766 375
- PP 112  
Ginsberg, Lawrence H., "ELF Atmosphere Noise Level Statistics for Project SANGUINE," 29 pp., Apr 1974. AD 786 969
- PP 113  
Ginsberg, Lawrence H., "Propagation Anomalies During Project SANGUINE Experiments," 5 pp., Apr 1974. AD 786 968
- PP 114  
Maloney, Arthur P., "Job Satisfaction and Job Turnover," 41 pp., Jul 1973. AD 768 410
- PP 115  
Silverman, Lester P., "The Determinants of Emergency and Elective Admissions to Hospitals," 145 pp., 18 Jul 1973. (To be published in the Journal of the American Statistical Association (Chapter 1) and Health Services Research (Chapter 2)) AD 766 377
- PP 116  
Rehm, Allan S., "An Assessment of Military Operations Research in the USSR," 19 pp., Sep 1973. (Reprinted from Proceedings, 30th Military Operations Research Symposium (U), Secret Dec 1972) AD 770 116
- PP 117  
McWhite, Peter B. and Ratliff, H. Donald,\* "Defending a Logistics System Under Mining Attack," 24 pp., Aug 1976 (to be submitted for publication in Naval Research Logistics Quarterly) \*University of Florida.  
\*\*Research supported in part under Office of Naval Research Contract N00014-68-0273-0017
- PP 118  
Barfoot, C. Bernard, "Markov Duels," 18 pp., Apr 1973. (Reprinted from Operations Research, Vol. 22, No. 2, Mar-Apr 1974)
- PP 119  
Stoloff, Peter and Lockman, Robert F., "Development of Navy Human Relations Questionnaire," 2 pp., May 1974. (Published in APA Proceedings, 81st Annual Convention, 1973) AD 779 240
- PP 120  
Smith, Michael W. and Schrimper, Ronald A.,\* "Economic Analysis of the Intracity Dispersion of Criminal Activity," 30 pp., Jun 1974. (Presented at the Econometric Society Meetings, 30 Dec 1973) AD 780 538  
\*Economics, North Carolina State University.
- PP 121  
Devine, Eugene J., "Procurement and Retention of Navy Physicians," 21 pp., Jun 1974. (Presented at the 49th Annual Conference, Western Economic Association, Las Vegas, Nev., 10 Jun 1974) AD 780 539
- PP 122  
Kelly, Anne M., "The Soviet Naval Presence During the Iraq-Kuwait Border Dispute: March-April 1973," 34 pp., Jun 1974. (To be published in Soviet Naval Policy, ed. Michael McGwire; New York: Praeger) AD 780 592
- PP 123  
Petersen, Charles C., "The Soviet Port-Clearing Operation in Bangladesh, March 1972-December 1973," 35 pp., Jun 1974. (To be published in Soviet Naval Policy, ed. Michael McGwire; New York: Praeger) AD 780 540
- PP 124  
Friedheim, Robert L. and Jehn, Mary E., "Anticipating Soviet Behavior at the Third U.N. Law of the Sea Conference: USSR Positions and Dilemmas," 37 pp., 10 Apr 1974. (To be published in Soviet Naval Policy, ed. Michael McGwire; New York: Praeger) AD 783 701
- PP 125  
Weinland, Robert G., "Soviet Naval Operations-Ten Years of Change," 17 pp., Aug 1974. (To be published in Soviet Naval Policy, ed. Michael McGwire; New York: Praeger) AD 783 962
- PP 126 - Classified.
- PP 127  
Dragnich, George S., "The Soviet Union's Quest for Access to Naval Facilities in Egypt Prior to the June War of 1967," 64 pp., Jul 1974. AD 786 318
- PP 128  
Stoloff, Peter and Lockman, Robert F., "Evaluation of Naval Officer Performance," 11 pp., Aug 1974. AD 784 012
- PP 129  
Holen, Arlene and Horowitz, Stanley, "Partial Unemployment Insurance Benefits and the Extent of Partial Unemployment," 4 pp., Aug 1974. (Published in the Journal of Human Resources, Vol. IX, No. 3, Summer 1974) AD 784 010
- PP 130  
Dismukes, Bradford, "Roles and Missions of Soviet Naval General Purpose Forces in Wartime: Pro-SSBN Operation," 20 pp., Aug 1974. AD 786 320
- PP 131  
Weinland, Robert G., "Analysis of Gorshkov's Navies in War and Peace," 45 pp., Aug 1974. (To be published in Soviet Naval Policy, ed. Michael McGwire; New York: Praeger) AD 786 319
- PP 132  
Kleinman, Samuel D., "Racial Differences in Hours Worked in the Market: A Preliminary Report," 77 pp., Feb 1975. (Paper read on 26 Oct 1974 at Eastern Economic Association Convention in Albany, N.Y.) AD A 005 517
- PP 133  
Squires, Michael L., "A Stochastic Model of Regime Change in Latin America," 42 pp., Feb 1975. AD A 007 912
- PP 134  
Root, R. M. and Cuniff, P. F.,\* "A Study of the Shock Spectrum of a Two-Degree-of-Freedom Non-linear Vibratory System," 39 pp., Dec 1975  
\*Department of Mechanical Engineering, University of Maryland.
- PP 135  
Goudreau, Kenneth A.; Kuzmack, Richard A.; Wiedemann, Karen, "Analysis of Closure Alternatives for Naval Stations and Naval Air Stations," 47 pp., 3 Jun 1975 (Reprinted from "Hearing before the Subcommittee on Military Construction of the Committee on Armed Service," U.S. Senate, 93rd Congress, 1st Session, Part 2, 22 Jun 1973)
- PP 136  
Stallings, William, "Cybernetics and Behavior Therapy," 13 pp., Jun 1975
- PP 137  
Petersen, Charles C., "The Soviet Union and the Reopening of the Suez Canal: Mineclearing Operations in the Gulf of Suez," 30 pp., Aug 1975
- PP 138  
Stallings, William, "BRIDGE: An Interactive Dialogue-Generation Facility," 5 pp., Aug 1975 (Reprinted from IEEE Transactions on Systems, Man, and Cybernetics, Vol. 5, No. 3, May 1975)

\*CNA Professional Papers with an AD number may be obtained from the National Technical Information Service, U.S. Department of Commerce, Springfield, Virginia 22151. Other papers are available from the author at the Center for Naval Analyses, 1401 Wilson Boulevard, Arlington, Virginia 22209.

CNA Professional Papers — 1973 to Present (Continued)

- PP 139  
Morgan, William F., Jr., "Beyond Folklore and Fables in Forestry to Positive Economics," 14 pp., Aug 1975
- PP 140  
Mahoney, Robert and Druckman, Daniel\*, "Simulation, Experimentation, and Context," 36 pp., 1 Sep 1975, (Published in *Simulation & Games*, Vol. 6, No. 3, Sep 1975)  
\*Mathematica, Inc.
- PP 141  
Mizrahi, Maurice M., "Generalized Hermite polynomials," 5 pp., Feb 1976 (Published in *Journal of Computational and Applied Mathematics*, Vol. 1, No. 4, 1975)  
\*Research supported by the National Science Foundation
- PP 142  
Lockman, Robert F., Jelm, Christopher, and Shughart, William F. II, "Models for Estimating Premature Losses and Recruiting District Performance," 36 pp., Dec 1975 (Presented at the RAND Conference on Defense Manpower, Feb 1976; to be published in the conference proceedings)
- PP 143  
Horowitz, Stanley and Sherman, Allan (LCdr., USN), "Maintenance Personnel Effectiveness in the Navy," 33 pp., Jan 1976 (Presented at the RAND Conference on Defense Manpower, Feb 1976; to be published in the conference proceedings)
- PP 144  
Durch, William J., "The Navy of the Republic of China — History, Problems, and Prospects," 66 pp., Aug 1976 (to be published in "A Guide to Asiatic Fleets," ed. by Barry M. Blechman; Naval Institute Press)
- PP 145  
Kelly, Anne M., "Port Visits and the "Internationalist Mission" of the Soviet Navy," 36 pp., Apr 1976
- PP 146  
Pulmour, Vernon E., "Alternatives for Increasing Access to Scientific Journals," 6 pp., Apr 1975 (Presented at the 1975 IEEE Conference on Scientific Journals, Cherry Hill, N.C., Apr 28-30; published in *IEEE Transactions on Professional Communication*, Vol. PC-18, No. 3, Sep 1975)
- PP 147  
Kessler, J. Christian, "Legal Issues in Protecting Off-shore Structures," 33 pp., Jun 1976 (prepared under task order N00014-68-A-0011-0023 for ONR)
- PP 148  
McConnell, James M., "Military-Political Tasks of the Soviet Navy in War and Peace," 62 pp., Dec 1975 (to be published in *Soviet Oceans Policy Study of Senate Commerce Committee*)
- PP 149  
Squires, Michael L., "Counterforce Effectiveness: A Comparison of the Topsis "K" Measure and a Computer Simulation," 24 pp., Mar 1976 (presented at the International Study Association Meetings, 27 Feb 1976)
- PP 150  
Kelly, Anne M. and Petersen, Charles, "Recent Changes in Soviet Naval Policy: Prospects for Arms Limitations in the Mediterranean and Indian Ocean," 28 pp., Apr 1976
- PP 151  
Horowitz, Stanley A., "The Economic Consequences of Political Philosophy," 8 pp., Apr 1976 (reprinted from *Economic Inquiry*, Vol. XIV, No. 1, Mar 1976)
- PP 152  
Mizrahi, Maurice M., "On Path Integral Solutions of the Schrodinger Equation, Without Limiting Procedure," 10 pp., Apr 1976 (reprinted from *Journal of Mathematical Physics*, Vol. 17, No. 4, Apr 1976)  
\*Research supported by the National Science Foundation
- PP 153  
Mizrahi, Maurice M., "WKB Expansions by Path Integrals, With Applications to the Anharmonic Oscillator," 137 pp., May 1976 (submitted for publication in *Physical Review D*)  
\*Research supported by the National Science Foundation
- PP 154  
Mizrahi, Maurice M., "On the Semi-Classical Expansion in Quantum Mechanics for Arbitrary Hamiltonians," 23 pp., May 1976 (submitted for publication in *Journal of Mathematical Physics*)
- PP 155  
Squires, Michael L., "Soviet Foreign Policy and Third World Nations," 26 pp., Jun 1976 (prepared for presentation at the Midwest Political Science Association meetings, Apr 30, 1976)
- PP 156  
Stallings, William, "Approaches to Chinese Character Recognition," 12 pp., Jun 1976 (reprinted from *Pattern Recognition* (Pergamon Press), Vol. 8, pp. 87-98, 1976)
- PP 157  
Morgan, William F., "Unemployment and the Pentagon Budget: Is There Anything in the Empty Pork Barrel?" 20 pp., Aug 1976
- PP 158  
Haskell, LCdr. Richard D. (USN), "Experimental Validation of Probability Predictions," 25 pp., Aug 1976 (to be presented at the Military Operations Research Society Meeting, Fall 1976)
- PP 159  
McConnell, James M., "The Gorskov Articles, The New Gorskov Book and Their Relation to Policy," 93 pp., Jul 1976 (to be printed in *Soviet Naval Influence: Domestic and Foreign Dimensions*, ed. by M. McGwire and J. McDonnell; New York: Praeger)
- PP 160  
Wilson, Desmond P., Jr., "The U.S. Sixth Fleet and the Conventional Defense of Europe," 50 pp., Sep 1976 (submitted for publication in *Adelphi Papers*, I.I.S.S., London)
- PP 161  
Melich, Michael E. and Peet, Vice Adm. Ray (USN, Retired), "Fleet Commanders: Afloat or Ashore?" 9 pp., Aug 1976 (reprinted from *U.S. Naval Institute Proceedings*, Jun 1976)
- PP 162  
Friedheim, Robert L., "Parliamentary Diplomacy," 106 pp., Sep 1976
- PP 163  
Lockman, Robert F., "A Model for Predicting Recruit Losses," 9 pp., Sep 1976 (presented at the 84th annual convention of the American Psychological Association, Washington, D.C., 4 Sep 1976)
- PP 164  
Dismukes, Bradford, "Soviet Employment of Naval Power for Political Purposes 1967-1975," Oct 1976
- PP 165  
Jondrow, James M., "Effects of Trade Restrictions on Imports of Steel," 67 pp., November 1976, (To be delivered at ILAB Conference in Dec 1976)
- PP 166  
Feldman, Paul, "Impediments to the Implementation of Desirable Changes in the Regulation of Urban Public Transportation," 12 pp., Oct 1976,
- PP 167  
Kleinman, Samuel, "ROTC Service Commitments: a Comment," 4 pp., Nov 1976, (To be published in *Public Choice*, Vol. XXIV, Fall 1976)
- PP 168  
Lockman, Robert F., "Revalidation of CNA Support Personnel Selection Measures," 36 pp., Nov 1976
- PP 169  
Jacobson, Louis S., "Earnings Losses of Workers Displaced from Manufacturing Industries," 38 pp., Nov 1976, (To be delivered at ILAB Conference in Dec 1976)